THE UNDER SECRETARY OF DEFENSE
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ACQUISITION AND
TECHNOLOGY

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Honorable John W. Warner
Chairman, Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

I am pleased to submit the Department's Plan to facilitate the transition into DoD acquisition programs of technology developed under the Small Business Innovation Research (SBIR) program. This Plan was developed in response to section 818 of Public Law 105-261.

I believe that this is a concrete and workable Plan that will significantly improve the Department's SBIR program and acquisition planning process, and thereby strengthen the technological capabilities of our armed forces. I have approved the Plan as attached, and we will work to ensure successful implementation.

If your staff has any questions or comments on the Plan, they should contact the DoD SBIR program manager, Jon Baron, at (703) 588-8636.

Sincerely,

J. S. Gansler

Attachment

cc: Honorable Carl Levin
Ranking Minority Member

Plan To Facilitate the Transition of SBIR Technologies Into Acquisition Programs

Background and Summary of Plan

I. Background: SBIR provides funding for defense R&D at small technology companies, a potent source of innovation.

The Defense Department's (DoD) Small Business Innovation Research (SBIR) program funds approximately $550 million annually in early-stage R&D projects at nearly 1000 small technology companies nationwide. A central purpose of the program is to stimulate the development of new technologies to improve U.S. military and economic capabilities. The program taps a powerful source of innovation – studies show that small businesses introduce roughly 2½ times as many technological innovations per employee as large businesses, and also a disproportionately large share of the "breakthrough" innovations forming the foundation of U.S. military and economic strength.

Studies also show that the SBIR program is a highly effective means of tapping this potent small business resource. The program has received consistently favorable reviews in independent evaluations by the General Accounting Office, National Academy of Sciences, National Bureau of Economic Research at Harvard University, and others. A 1996 DoD report to Congress found that SBIR-funded technologies have "resulted in significant improvements in U.S. military capabilities and major savings to the taxpayer." Examples are attached (at tab marked "SBIR examples").

II. Summary of Plan to Congress to facilitate transition of SBIR technology into acquisition programs

Congress directed DoD, in consultation with the Administrator of the Small Business Administration (SBA), to "develop a plan for facilitating the rapid transition into Department of Defense acquisition programs of successful [SBIR-developed technologies]" (section 818 of Public Law 105-261). DoD's Plan, developed by a working group of SBIR and acquisition program managers from across the Department, in consultation with the SBA, is attached (at tab marked "Plan"). It builds on ongoing efforts that DoD has recently undertaken to involve acquisition programs in the SBIR process (see tab marked "Ongoing Efforts"). The Plan has been approved for implementation at the start of fiscal year 2000 (except for a few provisions, as noted, to be implemented in the spring of 1999). The Plan's main provisions are summarized as follows:

- **Establish early communication between developers of SBIR technology and their end customers in acquisition programs.**

  In order for SBIR technologies to be integrated successfully into acquisition programs, it is essential to establish communication between the developers of the technology – including both SBIR companies and the authors of SBIR solicitation topics (usually

scientists/engineers in the DoD laboratories) – and their potential end customers in acquisition programs. This communication needs to begin as early as possible in both the SBIR and acquisition planning process, so that (i) the needs of the acquisition program customer can help guide development of the SBIR technology, and (ii) the acquisition program can plan for integration of the SBIR technology into its systems. Provisions A, B, and C of the Plan are designed to establish these communication links, by:

(A) establishing SBIR Liaisons at the major acquisition programs (including fielded systems), who will interface with the SBIR program managers within DoD and with the SBIR contractor community for the purpose of integrating appropriate SBIR technologies into their program;

(B) requiring that approximately half of the Military Departments' SBIR solicitation topics either be authored by an acquisition program or, if authored by a laboratory scientist/engineer, include a statement of interest by an acquisition program official; and

(C) creating a Technology-User Page on the DoD SBIR Web Site, to enable SBIR companies to identify and contact potential end customers in DoD, DoD prime contractors, and the private sector.

- **Enable acquisition programs and other potential users of SBIR technologies to leverage their investment in SBIR technologies.**

  Specifically, if acquisition programs or other users invest their own funds in second-phase SBIR projects, the SBIR program will provide matching SBIR funds up to a prescribed limit.

- **Issue guidance, from Senior Acquisition Executives to acquisition program managers, to include SBIR as part of ongoing program planning.**

- **Implement metrics of the extent to which acquisition programs integrate SBIR technologies into their programs.**

- **Educate the acquisition program and SBIR communities on the process for, and advantages of, integrating SBIR technologies into acquisition programs.**

  This will include establishment of a short seminar on the subject for all major acquisition program managers as part of their required training at the Defense Systems Management College.

III. Conclusion

We believe that these are concrete and workable provisions that will significantly improve the Department's SBIR program and acquisition planning process, and thereby strengthen the technological capabilities of our armed forces. Our new system of program metrics, included in the Plan, will enable DoD to track the effectiveness of these new policies, update Congress on the results, and make further improvements in the future.

Plan To Facilitate the Transition of SBIR Technologies into Acquisition Programs

A. **Major acquisition programs to designate liaisons to SBIR community.**

Each Acquisition Category (ACAT) 1 and 2 program will designate an individual who is (a) knowledgeable about the technology needs of the acquisition program and (b) responsible for technology infusion into the program, to serve as the program's SBIR Liaison. These Liaisons will interface with the SBIR program managers within DoD and with the SBIR contractor community for the purpose of integrating appropriate SBIR technologies into their acquisition program. The DoD SBIR Web Site will list the SBIR Liaisons and their contact information, so that both DoD laboratory personnel and SBIR contractors will have an efficient means of communicating with their end customers in acquisition programs at all stages of the SBIR process.

B. **Establish connectivity between SBIR solicitation topics and acquisition program needs.**

Approximately 50 percent of the Army, Navy, and Air Force SBIR solicitation topics, when submitted for inclusion in the DoD SBIR solicitation, will either --

(a) include, as an attachment, a brief (one or two paragraph) statement signed by the laboratory topic author and a DoD acquisition program official, stating that if the technology is successful, the acquisition program would be interested in providing non-SBIR funding during or after phase II (either directly or through the prime contract) to integrate the technology into the program if feasible, and describing the potential application; or

(b) be authored by an acquisition program official.

The acquisition program's SBIR Liaison (or other point of contact, if not an ACAT 1 or 2 program) will be listed in the topic, along with information on how to contact the Liaison.

In developing these solicitation topics, laboratory topic authors and acquisition program officials are encouraged to seek input from DoD prime contractors where appropriate.

Each Military Department may choose to phase in implementation of this policy, with 20 percent of the Military Department's topics meeting the above requirements in FY 2000, rising to 40 percent in FY 2001 and 50 percent in FY 2002. Also, to streamline implementation, each Military Department may develop a standard format for the agreement between the laboratory topic author and the acquisition program official.

C. **Create a system to enable SBIR contractors to contact potential customers/investors in DoD prime contractors and elsewhere.**

When each SBIR solicitation is publicly released, an SBIR Technology-User Page will be established on the DoD SBIR Web Site. On this Page, DoD prime contractors and other private sector or government entities can (a) identify themselves as potential customers for,

or co-investors in, technologies arising from a particular SBIR topic; and (b) provide information on how small companies can contact them.

D. **Enable acquisition programs and the private sector to leverage their investment in SBIR technologies.**

Under the SBIR program improvements approved by the USD(A&T) in October 1998, each of the DoD "Component" SBIR programs (Army, Navy, Air Force, Ballistic Missile Defense Organization, Defense Advanced Research Projects Agency, Office of the Secretary of Defense, Defense Threat Reduction Agency, and U.S. Special Operations Command) is currently scheduled to develop and implement a "Phase II Enhancement" policy by May 1999. Under this policy, the Component will provide a phase II company with additional phase II SBIR funding (in excess of the base phase II amount) if an acquisition program or the private sector provides matching funds. This policy provides a strong incentive for acquisition programs and the private sector (including DoD prime contractors) to fund the transition of SBIR technologies into acquisition programs and other end uses, because they can significantly leverage their investment (e.g., under this policy, for every dollar an acquisition program invests in a phase II SBIR project, SBIR will provide an additional dollar of phase II SBIR funding up to a ceiling determined by the DoD Component).[1]

E. **Senior Acquisition Executives to issue guidance to acquisition programs to include SBIR as part of ongoing program planning.**

The Senior Acquisition Executives for the Army, Navy, and Air Force will issue guidance to their acquisition program managers to: (a) include SBIR as part of their ongoing program planning, and (b) give favorable consideration, in the acquisition planning process, for funding of successful SBIR technologies. (The Navy Acquisition Executive has already issued such guidance in a May 1998 memorandum.)

F. **Implement metrics of the extent to which acquisition programs integrate SBIR technologies into their programs.**

Under the SBIR program improvements approved by the USD(A&T) in October 1998, DoD will (starting May 1999) track metrics for each phase II project that will enable DoD to measure the extent to which SBIR technologies are transitioning into acquisition programs and other end users in the government and private sector. DoD will report these metrics, in summary form, to Congress on an annual basis. The USD(A&T) will also set annual performance goals for these metrics consistent with the Government Performance Results Act (GPRA).

[1] Under this policy, a Component may, in addition to providing the additional phase II funding to companies that obtain matching funds, also provide such funding to other phase II companies showing exceptional performance.

G. **Educate the acquisition program and SBIR communities on the process for, and advantages of, integrating SBIR technologies into acquisition programs.**

OSD/SADBU, in consultation with the Component SBIR program managers, will develop and implement such an education strategy, to include: (a) establishment of a short seminar on the subject for all acquisition program managers as part of their required training at the Defense Systems Management College; (b) outreach to prime contractors at the corporate level; (c) acquisition program presentations to small businesses at the National SBIR conferences and to DoD's SBIR personnel at the Tri-Service SBIR conferences; and (d) establishment of an annual award to an acquisition program manager who has successfully integrated SBIR technology into his or her program.

Examples of Successful SBIR-Developed Technologies

Digital System Resources' COTS-based submarine sonar processor is now being used to upgrade the sonar equipment on almost the entire fleet of Navy submarines. This processor provides 200 times the computing power of existing, military-specific processors at a fraction of the cost. Sales of this technology to DoD and DoD prime contractors since 1991 exceed $50 million.

American Xtal Technology's technology for the production of Gallium Arsenide (GaAs) wafers – a critical component of many integrated circuits used in the defense weapons industry and elsewhere – reduces wafer defects by 1-2 orders of magnitude. On the basis of this technology, AXT has become the leading domestic manufacturer of GaAs for optical and electronic applications, with customers that include Lockheed Martin, TRW, Hewlett-Packard, and many universities and government laboratories. Military/commercial sales to date exceed $35 million, and represent 15 percent of the world market.

ParaSoft Corporation's software-debugging program (*Insure++)* is now used by most major developers of commercial software (e.g., IBM, Lotus, Microsoft) and organizations that develop software for in-house use (e.g., Naval Research Lab, Lockheed Martin, Hughes Aircraft, Boeing, Pratt-Whitney, the IRS, the U.S. Postal Service). Commercial/military sales since 1993 exceed $10 million.

Integrated Systems' technology for the automated writing of embedded software reduced the cost and time of software development for the DC-X experimental launch vehicle by over 50 percent. The company's cumulative sales revenues to date from its SBIR-developed technology exceed $100 million, about 15 to 20 percent of which are from sales to DOD or prime contractors. Integrated Systems, which began as a start-up company under SBIR, is now publicly traded with a market valuation of $500 million.

Active Technologies' "Lightning Charger" – an engine-drive alternator that is one-third the weight and twice the power of comparable alternators – is used for powering such equipment as emergency lights and refrigerators, and to start vehicles including cars and airplanes. It has generated commercial/military sales of $8 million since 1994 (an additional $90 million anticipated by the end of 1998), and is sold in major home appliance stores across the country. As used by the Army, it starts tank engines when the batteries have died.

Ophir Corporation's infrared-absorption hygrometer led to development of the "pilot alert" system installed in all B-2 bombers, which warns the pilot if the plane is about to produce a trail of condensation that could be detected by enemy radar.

Laser Guidance's laser-based visual landing aid for aircraft carrier flight operations shows pilots landing aircraft at night whether they are properly lined up and how to make flight adjustments when they are not. The Navy recently awarded Laser Guidance and Raytheon a $9 million contract to install the system on the entire fleet of aircraft carriers. This technology, by increasing the rate at which planes can board the carriers, is expected to save the Navy at least $22 million per year in aircraft fuel and maintenance costs, and also to significantly reduce the risk of aircraft accidents.

Ongoing Efforts by the DoD Components to Involve Acquisition Programs in the SBIR Process

The DoD Components have recently made significant progress in increasing the involvement of major acquisition programs in the SBIR program. For example, the Navy has, for several years, allocated a portion of its SBIR funds and solicitation topics for R&D projects selected by its major acquisition program (V-22 aircraft, F/A 18 E/F, etc.). In addition, the Assistant Secretary of the Navy for Research, Development, and Acquisition recently approved a memorandum (May 6, 1998) directing the Navy's Program Executive Officers and Program Managers to develop plans for utilizing the SBIR program as part of their ongoing program planning and milestone reviews.

In 1997, the Air Force significantly increased the role of its Program Executive Offices and Designated Acquisition Commanders in developing SBIR solicitation topics for review by the Air Force laboratories. In the Army, the laboratories and centers seek out direct participation by experts from the Program Managers and Program Executive Offices in developing and writing solicitation topics and in evaluating proposals. Also, the Army Research Office - Washington, which administers the Army SBIR program, works closely with the Army Training and Doctrine Command, its several battle laboratories (representing the "user" community), and the Army logistics R&D community, to prioritize topics and proposals according to their interests. BMDO receives direct input on its SBIR proposals from the National Missile Defense and Navy Theater Missile Defense programs. Additionally, the major acquisition programs in all three Services and BMDO often participate in the evaluation of SBIR proposals and assist in the management of specific SBIR projects.